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ON SPACE AND DURATION.

BY RICHARD KIRWAN, ESQ. L.L.D. F.R.S. & P.R.I.A.

READ, MARCH 4th, 1805.

NOTHING has contributed more to the growth and diffusion of that general scepticism, so prevalent in the last century, with respect to all questions that cannot be decided by the immediate testimony of the senses, as the inextricable difficulties that were supposed to attend the nature of objects most familiar to all mankind, and unhesitantly conceived to be thoroughly understood; for it seemed natural to conclude, that if, upon examination, we find an exact notion, even of these, impossible to be attained, we have reason to suppose, that other objects, with which we are not so well acquainted, are placed beyond the reach of human faculties: thus argued Bayle (Zenon), thus Hume reasoned. Now, certainly, no objects are more familiar to us than space and duration; and, in perplexing the notions of these, they have exhausted the whole force of their subtlety. If, on the contrary, it can be shewn, that the notions of these are perfectly plain and intelligible, in the sense in which they are universally taken, and that the absurdities, that have occurred in explaining them, might easily be avoided, by only adhering to their known signification, one stumbling-block, in metaphysical inquiries, will be removed.* This, then, is the purport of the present paper. But moreover, to shew the necessity of investigating subjects, which seemingly require no discussion, the difficulties that occurred on considering them, with the different opinions they suggested, must previously be stated.

The different systems of the Epicureans and Peripatetics, gave the first occasion to the controversies concerning the nature of space. The Epicureans admitted a vacuum, or empty space, as one of their first principles. The Peripatetics allowed, indeed, the possibility of a vacuum, but denied its existence. Des Cartes, in examining the question, denied even its possibility; asserting, that space necessarily implies extension: but a mere nothing, or non-entity, such as a perfect vacuum, if it existed, must be allowed to be, can have no properties, and, consequently, cannot be extended; for it would be absurd to say, for instance, so many *acres of nothing*. His disciples farther insisted, that space must be either a substance, or the modification of some substance, as, between these, nothing intermediate can be supposed to exist: but *space* is not a mode of any substance; therefore, it must, itself, be a substance, and, consequently, can never be supposed empty.

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* It is strange, that so eminent a metaphysician as Condillac should say, that we know nothing of the nature of space or duration. Art de Penser, p. 115, in 12mo.

To evade the force of this reasoning, the Peripatetics and Epicureans made different replies. The former said. that empty *space* is a mere capacity or possibility of receiving bodies; and, that its extension is only the possible extension of such bodies as may be placed in it But this answer was soon found to be unsatisfactory; for the space, *actually* existing between two distant bodies, would remain unaltered, even if all the intervening bodies were annihilated. Moreover, the capacity of receiving bodies, is merely the consequence of the vacuity of space, and not space itself. The Epicureans, as Gassendi and Bernier, followed by Le Clerc, supposed it to be a peculiar kind of being, which possessed no other property but extension. It was not, therefore, a spiritual substance, this not being extended; nor a material being, as it possessed no solidity, but a being *sui generis.* This opinion, appearing as untenable as the foregoing, from whence it differed only by being more fully explained, was embraced by no one else.

David de Rodon, an eminent Calvinist professor at Nismes, sometime before the year 1660, and possibly during the life of Des Cartes, struck with the absurdity of supposing any thing real and eternal besides God, advanced a very different opinion; as I find, by a letter from Bayle to La Coste, 4 Bayle, Oeuvres Posth. 845. He maintained, that space was nothing else than the Divine immensity. This opinion was embraced by Otto Guericke, about 1670, as Leibnitz thinks, and afterwards by the celebrated Dr. Samuel Clarke. It appears in the first edition of his Sermons, in 1706; and, more explicitly, in his several replies to Dr. Joseph Butler, in 1713, and his correspondence with the celebrated Leibnitz, in 1715, as I shall presently mention; and was, also, long before, obscurely hinted by many of the scholastics. In the mean time, that is about the year 1690, Leibnitz proposed a new system, namely, that of Monads, or simple substances absolutely unextended, but from whose disposition or order, with respect to each other, the *appearance* of space resulted. A system, so ingenious and well connected, that, for many years, it met the approbation of the most distinguished philosophers in Germany, and the admiration of the rest of Europe.

A few years after, Mr. Locke published his inestimable Essay on the Human Understanding; yet, his sentiments, concerning space, are confusedly and rather inconsistently stated. For, first, without giving any definition of space, he divides it into solid, and empty. He tells us, we acquire the idea of the first, when we conceive *it* so taken up, by a solid substance, as to exclude all other solid substances, and hinder two other bodies, moving towards each other in a straight line, from coming into contact with each other.—But, if we conceive two bodies, at a distance, to approach each other, without touching or displacing any solid thing, until their surfaces come to meet, we thus acquire the idea of space without solidity, or pure space. Lib. II. cap. iv. §. 2, 3. And (§. 5,) he adds,

" the extension of body being nothing but the continuity " of solid, separable, moveable parts, the extension of " space is that of unsolid, inseparable, and immoveable " parts."——Here he plainly asserts, that pure space is extended, and consists of immoveable and inseparable parts.

In his 13th chapter, he states the idea of space more accurately; for he says it is the *distance* between any two bodies, or between the parts of the same body: that, if it be considered only *lengthways*, without considering any thing else between, it is called *distance*; but, if considered in length, breadth, and thickness, it may be called *capacity*. The term *extension* is usually applied to it, in what manner soever it is considered, §. 2 and 3.—But, in §. 4, he no longer considers space as *distance*, but tells us, " that each " different distance is a different modification of space."—Yet, as different distances are rather different relations betwixt the distant bodies, I do not well understand how they can be called modifications of space; modification being a term usually applied to substances, and not to relations.

§. 16, he asks those, who inquire whether space be body or spirit, who told them, that there could be no other being but body and spirit? and, if they again inquire, " whe- " ther this space be a substance, or an accident? he fairly " tells them he does not know." From all which, it is plain, he considered simple pure space as something really existing, and distinct from distance.

And, accordingly, §. 21, he says, " if body be not " supposed infinite, which he thinks no one will affirm, " he asks, whether, if God placed a man at the extre- " mity of corporeal beings, he could not stretch his hand " beyond his body? If he could, then he would put his " arm where there was before space without body." And, chap. xvii. §. 4. he adds, " so far as body reaches, so far " no one can doubt of extension; and, when we are come " to the utmost extremity of body, what is there that can " satisfy the mind, that it is at the end of space, when " it perceives it is not?" and finally concludes, " that " space is infinite." And, §. 20, he denies, that the existence of matter is any way necessary to the existence of space.

In 1713, Doctor Berkeley first published his immortal work, on the Principles of Human Knowledge, in the cxvi §. of which he asserts, that pure space is nothing more than the possibility of motion, without the least resistance; and that, if all bodies were annihilated, there could be no motion, and, consequently, no space. And thus, he says, (§. cxvii.) " we free ourselves from that dan- " gerous dilemma, to which several imagined themselves " reduced, to wit, of thinking that real space is God; or " else, that there is something besides God, eternal, un- " created, infinite, indivisible, immutable; both which may " justly be thought pernicious and absurd notions." This opinion was afterwards adopted by Dr. Doddridge, in his

Lectures, p. 139; and by Mr. Condillac. *Art de Penser*, chap. viii.

At the latter end of the same year, an anonymous writer, stiling himself a Gentleman of Gloucestershire, but thought to be Dr. Joseph Butler, represented, to Dr. Clarke, some difficulties, which had occurred to him, in the Doctor's excellent treatise, intitled, *a Demonstration of the Being and Attributes of God;* for having there asserted, that the necessity of the Supreme Being must have existed *every where*, as well as always, Dr. Butler informed him he did not perceive any connexion between ubiquity and necessary existence. Dr. Clarke replied, that he considered space as a *mode* of the self-existing substance; and, being evidently necessary itself, proves that the substance, of which it is a property, must also be necessary. Nay, he adds, that extension is necessary to the existence of every being. In his third reply, he is still more explicit: for he asserts, that all other substances are *in* space, and are penetrated by it; but the self-existing substance is not in space, nor penetrated by it; but is, itself, as if it were, the *substratum* of space, the ground of the existence of space and duration. Dr. Butler, in his fourth Letter, owns himself convinced of what he at first doubted, that a necessary being must exist every where; and Dr. Clarke, in his answer to that Letter, approaches much nearer to the truth than he had before done, though still far from it. He says, " the idea of space is an abstract or partial " idea, of a certain quality or relation, which we evi-

" dently see to be necessarily existing; and, yet, (not be-
" ing itself a substance,) necessarily presupposes a sub-
" stance, without which it could not exist."

In his fifth Letter, Dr. Butler denies, that space can be supposed a property or modification of the Divine substance; for, if that were annihilated, still the idea of space would remain; and owns himself at a loss to define the nature of space. To which Dr. Clarke replies,
" that, since space necessarily remains, even after it is
" supposed to be taken away, and is not itself a sub-
" stance, as it is plain it is not, then the substance, on
" whose existence it depends, will necessarily remain also,
" even after it is supposed to be taken away; which shews
" the supposition to be impossible and contradictory."

Thus that correspondence ended. But, in an answer to another Gentleman, Dr. Clarke asserts, that infinite space is infinite extension; and, that to suppose it finite, is an express contradiction. And, that " they who remove the
" idea of infinity, by supposing space to be nothing but
" a relation between two bodies, are guilty of an absur-
" dity, by supposing that which is nothing to have *real*
" quantities; for the space, betwixt two bodies, is always
" unalterably just what it was, and has the same dimen-
" sions, quantity, and figure, whether these, or any other
" bodies, be there, or any where else, or not at all."—
To set bounds to space, is to suppose it bounded by something, which, itself, takes up space; and that is a contradiction.

But the Doctor was engaged in a much more animated correspondence, on the nature of space, shortly after. It arose on the following occasion. Leibnitz, irritated by the decision of the Royal Society of London, in favour of Newton, on the disputed question, whether he or Sir Isaac was the discoverer of the differential or fluxionary calculus, criticized, with much asperity, some parts of Sir Isaac's philosophy; and particularly, his sentiments on the nature of space. This censure he conveyed, in a letter to the Princess Caroline of Wales, afterwards queen-consort of George II., who communicated it to Dr. Clarke, and engaged him to answer it. His answer she transmitted to Leibnitz, and became the medium of the correspondence that ensued, betwixt these two great metaphysicians. Of their successive answers and replies, I shall give a brief extract.

Clarke. Space, finite or infinite, is absolutely indivisible, even in thought. To imagine its parts moved from each other, is to imagine them moved out of themselves; and yet space is not a mere point.

Leibnitz. Space cannot be a real, absolute being, otherwise it should be eternal and infinite. But, as it consists of parts, it is not a thing that can belong to God. Space is something merely relative, as time is: it is the order of co-existing things; as time is, of successive things. If space were an absolute being, something would have happened, for which no sufficient reason can be assigned: for space is absolutely uniform; and, without the things placed in it, one does not differ from another: therefore there can be no reason, why God should have placed bodies, in space, after one particular manner, and not otherwise. But, if space is nothing else, but that *order* or *relation*, and *nothing at all* without bodies, but the *possibility* of placing them; then, two states, to wit, that which now is, and another, supposed the reverse, would not at all differ from each other. Their difference would only be found, in our chimerical supposition of the reality of space: but, in truth, one would be exactly the same as the other; they being absolutely *indiscernible* (undistinguishable), and consequently, leaving no room to inquire for the reason of the preference of one to the other.

Clarke. Undoubtedly, nothing happens without a sufficient reason, why it *is*, rather than *not;* why thus, rather than otherwise: but, in things perfectly indifferent, *mere will* is that sufficient reason; as, in the present instance, why matter was created in one place, rather than in another; all places being originally alike. And the case is the same, even though space were nothing real, but only the mere order of bodies: for it would still be indifferent, whether three equal particles should be placed in the order a, b, c, or in the order b, a, c; for different spaces are equally distinct, though perfectly alike. Besides, if space were nothing real, but the mere order of bodies, it would follow, that, if the earth, sun, and moon, had been placed where the remotest fixed stars now are, and in the same order and distance, with regard to one another, as they now are, they would then be in the same place too, as they are now; which is an evident contradiction.

Space is not a being, an eternal and infinite being; but the property, or consequence of a Being, eternal, and infinite. Infinite space is immensity, but immensity is not God. Infinite space is *one*, absolutely and essentially indivisible. To suppose it parted, is a contradiction in terms, as there must be space in the partition itself; which is to suppose it parted, and not parted, at the same time. The immensity, or omnipresence of God, is no more a division of his substance into parts, than his duration is a division of his existence into parts. There is no difficulty here, but from the figurative abuse of the word *parts*.

If space were nothing but the order of co-existing things, it would follow, that, if God should move, in a straight line, the whole material world, with any degree of velocity soever, yet it would still continue in the same place, and nothing would receive a shock on the sudden stopping of the motion.—Farther, space is a *quantity*, which order and situation are not.

To argue, that, because space is uniform, and one part does not differ from another, therefore, bodies created in one place, if they had been created in another, supposing them to keep the same situation, with regard to each other, would still be in the same place as before, is a manifest contradiction.

Leibnitz. To suppose two things indiscernible, is to suppose the same thing, under two names; therefore, to suppose that the universe could have had, at first, another position, or place, than that which it actually had; and yet, that all the parts should have had the same situation among themselves, as that which they actually had; such a supposition is an impossible fiction.—If space be a property, it must be the property of some substance; but of what substance will bounded empty space be the property?

If infinite space be immensity, finite space will be the opposite to immensity; it will be mensurability, or limited extension. Now, extension must be the affection of something extended: but, if that space be empty, it will be an attribute without a subject; an extension, without any thing extended.

If space is an absolute reality, far from being a property opposed to substance, it will have a greater reality than substances themselves. God cannot destroy it, nor even change it. It will be immense, immutable, and eternal.—To say, that God can cause the whole universe to move forward, in a right line, or any other line, without making any other alteration in it, is a chimerical supposition: for two states, indiscernible from each other, are the same state; and, consequently, it is a change without any change.

Clarke. Two things, by being exactly alike, do not cease to be *two:* the parts of time are exactly alike, yet two instants are not the same instant, nor are they two names of the same instant.

Extramundane space (if the world be finite) is not imaginary.

Space, void of body, is the property of an incorporeal substance. It is not bounded by bodies, but exists equally within and without bodies. It is not enclosed between bodies; but bodies, existing in unbounded space, are themselves only terminated by their own dimensions. Void space is not an attribute, without a subject; for God is certainly present, and possibly many other substances, which are not matter. Parts, in the corporeal sense of the word, are separable: but infinite space, though it may, by us, be *partially* apprehended, that is, may, in our imagination, be conceived, as composed of parts; yet these parts, (improperly so called,) being essentially indiscerptible and immoveable, are not partible, without an express contradiction in terms.

If the world be finite, it is moveable by the power of God. Two places, though exactly alike, are not the same place; nor is the motion or rest of the universe the same state, any more than the motion or rest of a ship is the same state, because a man, shut up in the cabin, perceives it not; but, upon a sudden stop, it would have other real effects. Space is the place of all things, and of all ideas; as duration is the duration of all things, and of all ideas.

Leibnitz. The parts of *time* or *place*, considered in themselves, are ideal things, and therefore perfectly resemble one another, like two abstract units; but it is not so with two concrete units, or two real times, or two spaces filled up, that is, truly actual.

If space is the property of the substance which is in space, the same space will, sometimes, be the property of one body, and sometimes of another. If the author denies, that limited space is a property of limited things, he must also deny, that infinite space is a property of an infinite thing.

Spaces are sometimes empty, and sometimes filled up; therefore, there will be, in the essence of God, parts sometimes empty, and sometimes full, and, consequently, liable to a perpetual change.

God's immensity makes him actually present in all spaces; but, now, if God is in space, how can it be said, that space is in God? We have often heard, that a property is in its subject; but never, that a subject is in its property.

The author departs from the received sense of words; maintaining, that space has no parts, because its parts are not separable. But they may be assigned in space, either by the bodies that are in it, or by lines and surfaces, drawn and described in it.

A man in a ship may not perceive its motion. The reality of motion does not depend on its being observed; but it does, on the possibility of its being observed. There can be no motion, where no change can be observed.

As to the objection, that space is a quantity, and that situation and order are not so; I answer, that order has its quantity: there is distance, there is interval. Relative things have their quantity, as well as absolute ones; for instance, ratios or proportions.

Space is not the place of all things, for it is not the place of God; nor can I see, how it can be said to be the place of ideas, for ideas are in the mind.

Clarke. It was affirmed, that the motion of the universe would produce no change at all: yet no answer was given to the argument, that a sudden increase, or cessation of the motion of the whole, would give a sensible shock to all the parts. And no way is shewn, to avoid this absurd consequence, that the mobility of one body depends on the existence of other bodies.

The space occupied by a body is not the extension of the body; but the extended body exists in that space. There is no such thing, in reality, as bounded space: we only imagine, or fix our attention, on what part we please. It does not pass from subject to subject, but i always, invariably, the immensity of one and the same *immensum.* God suffers no change, by the variety and changeableness of things; as St. Paul says, Acts, xvii. 28. *in him all things move*, and have their being.

God does not exist in space, but his existence causes space. Space is not absolutely nothing; for of nothing there is no quantity, no dimensions, no properties. Nor is it a mere idea, for no idea of space can be framed, larger than finite. And yet, reason demonstrates, that it is a contradiction, that space should not to be actually infinite.

nite. Nor is it a bare relation of one thing to another, arising from their situation or order; because space is a quantity, which relations (such as situation and order) are not.

If it were true, that ratios and proportions were quantities, yet it would not follow, that situation and order, which are relations of a different kind, would be quantities also. But, secondly, proportions are not quantities, but the proportions of quantities. A proportion is not a greater or less quantity of comparison or relation, but the comparison of a greater or lesser quantity. Space is the place of ideas, because it is the place of the substances themselves, in whose understandings ideas exist.

Death prevented Leibnitz from replying to these last paragraphs; but the objections they contain were replied to, by Lewis Philip Thummigius, in 1722. I have not as yet been able to procure his annotations.

In England, this controversy was again revived, in 1731, by Dr. Law, late Bishop of Carlisle, in his notes on Archbishop King's Essays on the Origin of Evil, who denied the reality of space; and was soon after answered (as is supposed) by Dr. Gregory Sharpe, who supported Dr. Clarke's opinion. This answer Dr. Law endeavoured to invalidate, in his notes to a second edition of King's Essay; and to his objections, Sharpe again replied.

The new combatants treated this subject in a manner somewhat different from the preceding. Of this I shall now give a summary view.

Law. I can form no other notion of space, than either, first; as the mere negation or absence of matter: or, secondly; as the extension of body, abstractedly considered, as separate from any particular body.*

Of space, considered as the absence or negation of matter, we may have a positive idea, as Mr. Locke has fully shewn, B. II. c. viii. §. 4, 5. as well as of silence, darkness, and many other privations. But, to argue from such an idea, that space is something external, and has a real existence, is as little reasonable as to say, that, because we have an idea of darkness, different from that of light, therefore, darkness must be something positive, and has as real an existence as light has.

To say, that space must have existence, because it has some properties, for instance, *penetrability*, or the capacity of receiving bodies; seems to me the same, as to say, that silence must be something, because it has the property of admitting sound.

To attribute extension, or parts to space, according to the first notion given of it, would be the same, as to talk of the extension or parts of *absence*, or any other privation.

Sharpe. To suppose that space is nothing but the absence of matter, is absurd; for, if we suppose two walls

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* He adds a third mode of conceiving it, which is not, indeed, his own, but rather Cudworth's; namely, that of a subject, or substratum of extension, *in abstracto*. Of this, as too subtile, and scarcely intelligible, I shall take no notice.

not to touch one another, there must necessarily be something between them, otherwise there would be no difference between touching and not touching.

Whatever is indued with properties, must actually exist. Now space has the property, or capacity, of receiving all bodies. Darkness, abstractedly considered, has not the property of admitting light, nor silence that of admitting sound; but darkness is rather that part of space that is free from light.

Thus far the debate was intelligibly carried on, and some new matter advanced. The remainder consists chiefly of a repetition of the arguments, already adduced in the Leibnitzian correspondence, and therefore requires no farther notice.

We may now state the true notion of space; which is so obvious, that it is surprizing it should have escaped the notice of these profound metaphysicians.

Space is nothing more or less, than the relation of two, or more, distant bodies to each other, or of the distant parts of the same body to each other.

All relations are merely mental, but the objects related are real. The foundation of this relation is the standard extension; or the number of such extensions, as inches, feet, miles, &c., as we find or conceive necessary, to reach from one body to the other. Thus, all that can, with truth, be affirmed of space, may clearly be conceived.

Its primary notion is not the capacity of receiving bodies; this is merely a consequence, inferred from distance:

in any other point of view, this capacity is merely fictitious. Otherwise, before any body was created, a capacity for receiving bodies existed: that is, when nothing whatsoever existed. As well might it be said, that a capacity of receiving spirits existed, before any spirit was created. From what principle this capacity is inferred, will presently be seen.

The notion of *distance* is originally acquired through the sense of feeling. By the repetition of tactile sensations, from one part of the body to another, we gain the notion of *extension;* which consists in nothing else, than in the number and continuity of tactile sensations, either perceived or conceived to be perceptible, betwixt two or more objects. The difference between the first and last of these sensations, is what is called *distance.* Neither the knowledge of distance, nor, consequently, that of extension, is originally gained by the sight, but gradually learned, by experience of the connexion betwixt distant objects, previously known by tact and visual appearances, and the motion and feelings of the eye itself; as Dr. Berkley has clearly shewn, in his admirable Essay on Vision, and has been amply proved, by the subsequent experiments of Dr. Cheselden.* From this connexion it happens, that the different visible appearances, of near and distant bodies, constantly suggest the idea of extension, as subsisting be-

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* Some of the most perspicacious of the scholastics, much despised as they are, reasoned in the same manner. Mastrius Log. 329.

tween them, even when a perfect vacuum is supposed: but this suggestion not being, in that case, founded in reality, is a mere imagination. It is this imagination that so far imposed on Dr. Clarke and others, as to persuade them to think there is *something*, where, in fact, there is nothing: an imagination which, arising from an early association, cannot be got rid of, as Clarke and his correspondent allowed; though, by an accurate investigation, it is proved to be a deception.

When bodies are distant from each other, there is nothing to prevent another body from being placed between them, if none be already so placed. This denial of any obstacle is what is called *capacity*; it is nothing positive, but merely a possibility, inferred from uncontinuous distance.

Still, it will be said, that there is an interval between distant bodies, otherwise they could not be distant; and this interval may be measured, and therefore it is extended. Now, this interval is what is called *space;* and, consequently, space is something real and extended.

To this argument, which comprehends every thing that can be said, in favour of the reality of space, I answer, that this interval is, in nothing real, different from distance: and this latter, indeed, is measurable, by means of a solid line, reaching from one of the distant bodies to the other, and consequently extended. To such a line measures may be applied: but, without conceiving such a line, the measures would be applied to nothing, which is an evident absurdity.

Hence we may infer, that, without two bodies at least, there can be no distance, nor, consequently, *space*. Still less can it be supposed to exist, when there are no bodies at all; and therefore, antemundane and extramundane spaces are merely imaginary.

If it be asked, where a single body would be placed, if no other body were created? I answer, *no where*, that is, in no place; *place* being, as Mr. Locke justly observes, B. II. chap. xiii. §. 7, the relation of distance, betwixt two or more points, which are considered as at rest. When, therefore, there are no such points, there is no place: and hence, as he remarks, ibid. §. 10, to say that the world is *somewhere*, means no more, than that it does exist, but not its location.

I shall now take a retrospective view of the opinions already mentioned; and observe how far they are just, and how far defective.

SECTION II.

Des Cartes, yielding to the suggestions of imagination, which we need not be surprized at, since it imposed on Newton, Clarke, and, at times, on Locke himself, asserted, that space necessarily implied extension. Now, extension is a mere abstraction, and, consequently, can have no real existence. The term *extension* means no more than *extended things*, taken *ad libitum*. Of these, like all other abstract terms, it is a compendious expression. In this respect, Des Cartes and his followers reasoned more consequentially than many succeeding philosophers: for he inferred an extended thing, namely, *matter*, to exist wherever space exists; and thence denied the possibility of a vacuum. His opinion having been long since satisfactorily refuted, and now universally abandoned, requires no further notice.

Mr. Locke seems, at different times, to have entertained different opinions of the nature of space; for, after clearly stating, B. II. chap. iv. §. 2, 3, and chap. xiii. that space is the distance between two bodies, or between the parts of the same body, if the body be considered lengthways, (and the same may be said of the parts of the breadth and the thickness, for their extremes also are distant from each other,) he denies, chap. xvii. §. 20, that matter is any way necessary for the existence of space: and thus the notion of distance is completely abandoned. To this persuasion he was led, by the supposition, that, if a man were placed at the extremity of the material universe, and stretched out his arm, his arm would still be in space. But this is an evident mistake: his arm would be in nothing, or surrounded by nothing; but different parts of his arm, being at a distance from his body, would form a solid space. And hence Locke himself allows, that the world is, properly speaking, *no where*, as already mentioned: though, in a sense, which he justly calls confused, he allows it may be said to be in the space which it takes up; which is thus improperly distinguished from its extension, that is, the distance of its parts from each other.

Almost all the assertions of Dr. Clarke originated in the erroneous supposition, that space does exist, where, in reality, there is nothing at all. He supposed it to exist beyond the bounds of the corporeal universe, where even distance cannot exist. And this for no other reason, than that he conceived an extension, to which he could set no bounds: not recollecting, that this extension was a mere creature of imagination, being barely the idea of visual distance extended at pleasure; and, consequently, derived from a sense, through which the knowledge of extension and distance is acquired only by experienced connexions with the sensations of touch. Whereas it is certain, that a man, born blind, would never imagine space to exist, where there were no objects of *touch* betwixt which a distance might be found. He inferred the necessity of God's existence *every where;* that is, in every *place*, when there was no place whatsoever: and, even if there were places, neither God, nor any spiritual being, can have any proper location. God is omnipresent, by his power, his knowledge, and his operation, and not by the fictitious attribute of immensity, which cannot be distinguished from unlimited extension.

Hence, he farther asserted, as I have already mentioned, that extension was necessary for every being. An opinion, as Dr. Priestley justly observes, at present rejected by the most consistent immaterialists.*

How God can act where he is not, is as easily conceived, and as justly admissible, even if inconceivable, as that he knows contingent events that are to happen in times, with which he does not at present co-exist. As infinite knowledge is sufficient in the one case, infinite power is sufficient in the other.

As all the subsequent assertions of Dr. Clarke proceed from the erroneous notions just mentioned, no farther notice need be taken of them. But, as some of his arguments, in favour of extramundane space, have an imposing appearance, I must shew that they are destitute of any reasonable ground.

First, he takes for granted, that if this world be not infinite, it is moveable by the power of God: and, consequently, that there are two places; one from which, and the other towards which it may be moved.

To this I make this short reply, that, if there were but one body in existence, there could be no motion: for there can be no motion, where there can be no direction, either upwards or downwards, eastwards or westwards, &c. And as, in the supposed case, these, or any other direction, exist only in imagination, there, and there only, motion can exist. This even the scholastics perceived, of whom Dr. Clarke thought too contemptuously.

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* Disquisitions on Matter and Spirit, §. 6. But he was deceived in conceiving this opinion to be entirely modern; for it was the opinion of Clemens Alexandrinus, 2 Strom. circa Medium; and John Damascene, *De Fide*, cap. xiv. who expressly says, God is no where; and Gregory of Nyssus, adversus Eunom. Lib. I. denies that angels, or any intelligent beings, bear any relation to space. Bœtius Hebd. says, that incorporeal substances cannot be said to be in any place. The Thomists also hold, that angels cannot be said to be in any place but metaphorically. See Gonet, 342, folio.

Farther, he thinks it absurd to say, that space is absolutely nothing; for of nothing there is no quantity, dimensions, or property: nor is it a mere idea; for no idea of space can be formed larger than finite, yet space must be infinite. Nor is it a relation of one thing to another, arising from situation or order; for space is a quantity, which situation or order are not.

These objections arise from the wrong notion he held of space: its primary notion is distance. Distance implies an interval between the distant bodies; which interval, if filled up, is called solid space; and, if unoccupied, is called empty space: but this is nothing, real and physical; and, consequently, can have no dimension, or any property, but in proportion to the distance of the bodies betwixt which it intercedes, a capacity of receiving bodies, of certain dimensions, is inferred to exist; not as any thing physical, but as a mere possibility, and, like other relations, existing only in the mind; but whose foundation (that is, the distant bodies) is physical and real. Distance is a relation susceptible of degrees, and, consequently, of quantity, though order and situation may not.

Grotius probably understood the text quoted from St. Paul as well as any man; and was, certainly, an unprejudiced judge in this case, as he was dead many years before this controversy was started. He tells us, it is an Hebraism; *in him;* that is, through him, through God's beneficence we exist: he bestows life, and necessary motion, and is near us by his power.

On Leibnitz's opinion I need not animadvert: as far as it differs from the notion here given, it is satisfactorily refuted by Dr. Clarke; as may be seen in the preceding pages.

Dr. Law's idea of space agrees in effect with mine; yet I do not think it expressed with sufficient accuracy, which seems to give his adversary some apparent advantage.

OF

DURATION, TIME, AND ETERNITY.

DURATION is a word applied indiscriminately to the existence of created beings, and to that of the Supreme Being; but its signification, when applied to the former, is widely different from that which it bears when applied to the latter. When applied to the former, it essentially includes a relation to succession: when applied to the latter, it essentially excludes any relation to succession. It cannot even be called *permanent* or *continued* existence, for, in such expressions, a relation to succession is implied, during which the existence is continued, repeated, or unaltered: hence, no definition common to both can be given. We must, therefore, separately mark what it denotes in each case.

Duration, when applied to created beings, denotes co-existence with succession. I say *co-existence*, because such beings are said to last or endure only by comparison with different parts of succession: a being, that existed only for one instant, that is, the minutest portion of succession, could not be said to have had any duration. Co-existence, with two instants at least, is requisite. Hence Locke justly observes, that we gain the idea (or rather notion) of duration, by reflecting on the succession of our own thoughts; as during this succession we know that we exist.

To call duration a continuation of existence, is giving a definition merely verbal; as this barely denotes the signification of the word, and denotes the thing defined, only by implication.

But, as the succession of our thoughts is neither regular nor constant, and must be unknown to others; a regular, uninterrupted, and uniformly varied succession, (or at least, whose slight irregularities are discoverable only at distant periods,) has been universally adopted as the standard, by comparison with whose component parts, the duration or co-existence of all other created beings is determined and measured.

It is this succession, or co-existence with it, or some of its periods, that forms what is called *time;* for it is sometimes taken for the mere succession, and sometimes for co-existence with it, or with some of its periods.

The standard of succession which most nations have adopted, as a measure of the duration of every thing else, is the apparent annual, and diurnal, progression of the sun, or the different phases of the moon, or both. Thus, years, months, and days are obtained. The minuter portions, as hours, minutes, seconds, and thirds, are discovered, by the help of various machines well known.

That time consists of parts, ultimately indivisible, is briefly and clearly demonstrated, by Mr. Hume.* "It

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* Treatise on Human Nature, Vol. I. p. 61.

" is a property inseparable from time, and which, in a " manner, constitutes its essence, that each of its parts " succeeds another; and that none of them, however con- " tiguous, can ever be co-existent. For the same reason " that 1737 cannot concur with the present year, 1738, " every moment must be distinct from, and posterior or " antecedent to, another. It is certain, then, that time, " as it exists, must be composed of indivisible moments: " for if, in time, we could never arrive at an end of " division, and if each moment, as it succeeds another, " were not perfectly single and indivisible, there would " be an infinite number of co-existing moments; which, " I believe, will be allowed to be an arrant contradic- " tion." This last point he proves from Malezieu. " Ex- " istence, it is evident, belongs only to unity, and is ap- " plicable to number, only on account of the units it " contains. Twenty men may be said to exist, but it is " only because one, two, three, &c. exist; and, if you " deny the existence of the latter, that of the former falls " of course. It is, therefore, absurd, to suppose any num- " ber to exist, and yet deny the existence of units." But how far this division may extend, cannot be perfectly ascertained. It is certain, it can be carried far beyond our ideas of it; and that, by our auricular perceptions, it may be carried much farther, than by our ocular perceptions.

Thus, by the experiments of Chevalier D'Arcy,* it appears, that five or six distinct sensations, of a luminous body,

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* Mem. Par. 1765.

body wheeled about, may be had in one second. But, if the velocity of the rotation, and, consequently, the number of sensations, be increased, they cease to be distinct, and a continued luminous circle is formed: but, if an opaque coloured body be thus whirled about, a few more distinct sensations may be discerned. Of auricular sensations a far greater number may be distinguished: for our celebrated astronomer, Mr. Herschel, has discovered, that upwards of 160 of them may be discerned in a second of time, before they become confused and undistinguishable.* In general, where the greatest attention is not bestowed on the succession, particularly on that of visual sensations, the memory of those immediately past is so vigorous and lively, that many of them are confounded with, and appear belonging to, the present time, taken in the strictest sense. It is on this circumstance that many of the impositions of jugglers are founded.

The apparent length of time depends wholly on the attention paid to its succession; it appears short, to those whose attention is firmly fixed on one object. For, attention to succession, in such case, is, as much as possible, excluded. It appears still shorter, to those who sleep without dreaming or interruption; as they are not conscious of any succession, and judge of the length of time, occupied by sleep, only by the sensations usually associated with rest, and the changes resulting from succcession.

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* See Mr. Watson's Treatise on Time, p. 32.

succession. So also, the duration of an agreeable state of mind appears short, even though it should co-exist with many successive perceptions; because, the pleasure arising from them, and not their mere succession, is that which chiefly occupies the attention.

On the other hand, when the attention is not attracted to any particular perception, but wanders, with indifference or disgust, from each of the ideas that present themselves, their number is increased; and as the mind flies rapidly from one to another, their number being thus increased, the time appears longer.

For a similar, but a much stronger reason, when we are in a painful state, its apparent duration is much longer than the real: its termination being every instant coveted, the succession of these instants is strictly attended to.

A learned and profound metaphysician endeavoured to prove, that, strictly speaking, there is no such thing as *present* time. The question, however, is merely verbal. Undoubtedly, the present, taken in the strictest sense, denotes an indivisible instant, which can neither be called time nor duration: but it is on a perceptible aggregate of such instants, of which the memory is as vigorous, or nearly so, as the sensation corresponding with a single instant, that we bestow the name of *present time*, in the usual sense.

Another lively, amusing, but eccentric writer, taking it for granted, that time consists only in the succession of our ideas and actions, asserts, that " however these may " be accelerated or retarded, time will be just the same, " that is, neither shorter nor longer, provided the same " ideas and actions succeed one another: as far, I mean, " as it relates to beings so thinking and acting. For in- " stance; were the earth, and all the celestial bodies, to " perform the same revolutions in one day, which they " now perform in a whole year; and were all the ideas, " actions, and lives of mankind, hastened on in the same " proportion; the period of our lives would not be in the " least shortened, but that day would be exactly equal " to the present year. If, in the space of seventy or " eighty of these days, a man was born, educated, and " grown up, had seen his children come to maturity, &c. " and, during this period, had all his ideas and actions, " all his enjoyments and sufferings, accelerated in the same " proportion, he would *not only seem* to himself, and to " all who lived in the same state with him, and measured " time by the same standard, to have lived as long, but " *actually, and in fact*, would have lived as long as one " who resides on this globe as great a number of our " present years."—Is not this to say, that, actually, and in fact, seventy or eighty of our days are equal to seventy or eighty of our years? It is plain, that, even if the hypothesis were possible, it is only in *appearance* that an equality could subsist between them. But the hypothesis itself is grounded on no analogy whatsoever; to deduce any consequences from it, is, therefore, an idle attempt.

Judging from experience, we find, that violent pain or anxiety, and not the mere number of succeeding ideas, apparently lengthens our notion of duration, or makes us think time longer than it really is. The number of ideas, that occupy our imagination, in reading an agreeable book, nay, the number of letters of which each line of it consists, and which must successively be perceived, must be very considerable; and yet the time seems short while we read it.*

ETERNITY.

Duration, when that of the Supreme Being is meant, denotes existence exempt from any commencement or termination. This mode of existence is what is commonly called *eternal*. It is incomprehensible and inconceivable, but implies no contradiction; for the notion of existence, and that of absence of commencement, and termination, are so far from being contradictory to each other, that a Being, so circumstanced, has been demonstrated to exist.—It is intelligible, though imperfectly.

By this definition it appears, that succession is essentially excluded from the notion of eternity; for succession necessarily implies a beginning, as will presently be seen.

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* Whoever wishes for a more ample account of *Time*, will receive abundant satisfaction, on perusing the profound, and yet perspicuous treatise of Dr. Watson, Jun. on *Time*, published by Johnson, in 1785.

And, yet, eternity cannot be said to be a *perpetual instant*, as some have called it; for that is an express contradiction, and even more glaringly contradictory, than the *punctum stans* of some scholastics; for *instant* denotes the minutest portion of time or duration, and *perpetual*, the greatest duration.

Hence, we may learn the true import of some usual expressions.

From all eternity; that is, without beginning.

To all eternity; that is, without ever ending.

Hence, also, we may collect, that eternity cannot be called a *quantity;* for its notion implies no magnitude whatsoever, but barely existence unlimited; and, therefore, cannot be said to be infinite, nor even equivalent to an infinite succession; for such a succession is impossible, and purely chimerical.

The notion of eternity is positive, and not merely negative, as Locke supposes; though it includes a double negation. For notions, that are commonly called negative,* or privative, are those which directly import the non-existence or absence of something positive; as *darkness* does that of light, *silence* that of sound, *death* the cessation of life, &c.: whereas *eternity* directly imports existence; and, indirectly, the absence of something positive, namely, a beginning; and, also, of something negative, namely, a termination: or, in other words, existence, unoriginated and interminable. It cannot be even called continued existence: for continuance implies a beginning, an existence begun, and thenceforward prolonged.

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* I have substituted the term *notions* for that of *ideas*, which Locke has employed too generally. The word idea should never be used to denote any thing, but representations of objects perceived by sense.

The Supreme Being, to whom alone the notion of eternity is applicable, having bestowed existence on other beings; on comparing the commencement of these, with the existence of that Being, from whose will and power they originated, the relations of the priority of the latter, and the posteriority of the former, necessarily arise. Now, priority and posteriority constitute succession: but this succession is not that of *time;* for, in this, the prior parts of the succession instantaneously become *past;* whereas, in the former, the prior existence is constant and unaltered. The interval betwixt both is unmeasurable; as we have no standard, nor indeed is any possible, which can be applied to it. Thus, we cannot say, that the existence of God preceded that of any created being, a million of years, or only a single instant; as the quantity of the interval, or distance, is necessarily unknown.

Hence, the question, whether God could not have created the universe sooner, implies an absurdity: for the word *sooner* expresses a comparison of times; whereas *time* began only on the creation of succession.

In reply to some captious questions, it should be observed, that, since the creation, the duration of God coexists with succession. Hence, though it cannot be said, that the duration of God has now subsisted longer than it has done, at any other period, subsequent to the creation; yet, it may be said, that its co-existence, with created beings, is now longer than it was at any period preceding the present.

The only important point, that now remains to be considered, is, whether any created being could have been eternal; as some imagine the universe, or at least some part of it, to have been? To me it appears sufficiently clear, that creation, and eternity, exclude each other. Creation implies, at least, an instant, in which the created being did not exist; otherwise existence could not have been bestowed upon it: it must, therefore, have had a beginning; whereas eternity excludes a beginning.

In answer to this, it has been said, that, if the sun were eternal, its light would also be eternal, though produced by it. But it is easy to see, that, if the sun were eternal, its light would indeed be eternal; because the sun is essentially lucid; for without light it would not be a sun. But it does not follow, that the light was produced by it, but rather that both were co-existent; the one being included in the notion of the other. This cannot be said of the notion of the Supreme Being, and any creature; for he may well be conceived to exist, without creating any being whatsoever.

Another much more plausible objection is made by the scholastics. The existence of the world, say they, is eternally possible; and the Divine Omnipotence is also eternal:

all which is true. But their inference, that the effect, resulting from an eternally omnipotent cause, could also be eternal, is inadmissible; as causation essentially requires priority of existence: without priority it could not be understood; it would be perfectly unintelligible.—And the reply they make to this exactly confirms it; for they say, that priority of *nature* is sufficient. Now, what else is priority of nature, but that priority, which the nature or notion of causation essentially implies, namely, that of existence? Any other feigned priority is unintelligible.—Their further assertion, that according to this statement, an infinite succession of ages must have been possible, before the creation of any being, is perfectly chimerical: not only because the interval betwixt the creation, and the pre-existence of the Creator, is unknown, as already said; but, also, because an infinite succession is impossible, even in the divine ideas; a commencement being essential to succession, as I shall now demonstrate.

Mr. Locke says, we derive the idea of eternity from those of succession, and duration, by adding the periods of duration as often as we please; and thus suppose it a duration, exceeding as many such periods as we can reckon,* without ever coming to an end. Now, it seems to me very clear, that this is rather a fruitless attempt to gain an idea, or rather notion of eternity, than an actual acquisition of that notion: for, after all these attempts,

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* B. H. c. xiv. §. 28, 31, 32. and c. xvi. §. 8.

tempts, we are as far from gaining it as we were at first; as he himself acknowledges. Hence, he thinks, that " if " we cannot separate succession from any duration what" soever, our idea of eternity can be nothing but that of " infinite succession of the moments of duration, wherein " any thing does exist."*

The notion, however, of an actual infinite succession of moments, implies an evident absurdity: for such a succession should consist of as many years, nay millions and centillions of years, as it should of moments; and thus the whole, and the parts composing the whole, would be equal. If we suppose an infinite number of years, assuredly the number of moments, of which those years consist, must be still greater, and exceed infinity; which is absurd. Thus, if an infinite succession of moments had passed before the creation of the world, must it not be increased by the number of them that have elapsed betwixt that time and the present?

And, as to the eternity of our world, let it be considered, that motion, namely, a successive progression round a common center, is necessarily attributable to those planets, which form what we call the world: and that our globe, in particular, includes numberless beings, that exist in endless succession to each other. Now, an unoriginated or eternal succession, implies an absurdity, as has been just shewn; and may be farther demonstrated thus.

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* Chap. xvii. §. 16.

From the motion of the earth, for instance, round its axis, and round the sun, the succession of days, nights, and years, originates. Now, the days necessarily precede the years: therefore, the years must have had a beginning, and could not, therefore, have been eternal. In like manner, the days must have preceded the nights, or the nights the days: one or other of them must, therefore, have had a beginning. Moreover, no portion of time can be said to be *past*, that was not once *present*, and antecedently *future:* therefore, the whole infinite collection must be supposed to have contained an infinite number of days and years *past*, and the same infinite number of days and years *future;* which is a contradiction so palpable, that Doctor Gregory Sharpe* found no other way of avoiding it, than by asserting, that there is a time, now actually *past*, that never was present; which is equivalent to saying, that a time *has* existed, which never *was* in existence.

The opinion of some scholastics, that eternity is a *punctum stans*, or a permanent moment, being utterly unintelligible, is, I believe, at present, generally abandoned.

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* See his Defence of Dr. Clarke's Discourse on the Attributes, &c. p. 27.